

XIII.—*The Anatomy and Classification of the Teleostean Fishes of the Order Iniomi.* By C. TATE REGAN, M.A.

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THE Iniomi are marine malacopterous physostomes with the pelvic fins abdominal or thoracic in position and the pelvic bones free from the cleithra; an adipose dorsal fin is typically present, the præmaxillaries exclude the maxillaries from the gape, the gill-openings are wide, the pectoral arch is attached to the skull by a forked post-temporal, there is no meso-coracoid, the vertebral centra are coossified with the arches, the air-bladder is small or absent, and the ovaries are provided with oviducts.

The families *Rondeletiidae* and *Cetomimidae* are known only from a few specimens taken in deep water; they presumably pertain to this order, for the præmaxillaries form the upper border of the mouth, but these fishes differ from the rest in the posterior position of the dorsal fin, which is opposed to the anal. They will probably form a distinct suborder when they are better known.

Of the Cretaceous fishes which may pertain to the Iniomi the *Chirothricidae* are probably related to the *Aulopidae* or *Suidae*, but the *Enchodontidae* appear to me to show more agreement with the *Stomiatidae* than with the *Alepidosauroids*, to which Smith Woodward considers they are related. The *Dercetidae* are of uncertain relationships, but the orbital and postorbital parts of the skull and the post-temporals show considerable resemblance to *Evermanella* (*Odontostomus*), whilst the ethmoid region and jaws are more like those of *Alepidosaurus*. Of the fishes placed by Smith Woodward in the *Scopelidae* many are of very doubtful position, but *Sardinioides crassicauda* and *illustrans* certainly belong to the *Aulopidae*. Other species referred to *Sardinioides* resemble *Neoscopelus* or *Chlorophthalmus*, to which *Acrognathus* may be related. *Apateodus* is probably near *Alepidosaurus*.

The skeletal characters of the Iniomi have not hitherto received much attention. Günther has figured the pectoral arch of *Omosudis* and *Bathypterois* ('Challenger' Deep-sea Fishes). Gill has pointed out that in several families the post-temporals "impinge upon the occiput." Smith Woodward has figured the head skeleton of *Aulopus* for comparison with *Sardinioides* (Palæontograph. Soc. 1902).

Suborder 1. MYCTOPHOIDEA.

Caudal well-developed, free from the anal; pectorals lateral; pelvics 6-11 rayed, below or behind the pectorals. Mouth terminal, not or but little protractile. Palatine normally developed, its anterior end attached to the vomer, with a process directed upwards and outwards which overlaps the proximal end of the maxillary and is supported by a lateral projection of the mesethmoid; interoperculum not reduced. Cleithrum attached to supracleithrum at the lower end of the latter; postcleithrum, when present, laminar, attached by its anterior edge to inner face of supracleithrum or cleithrum.

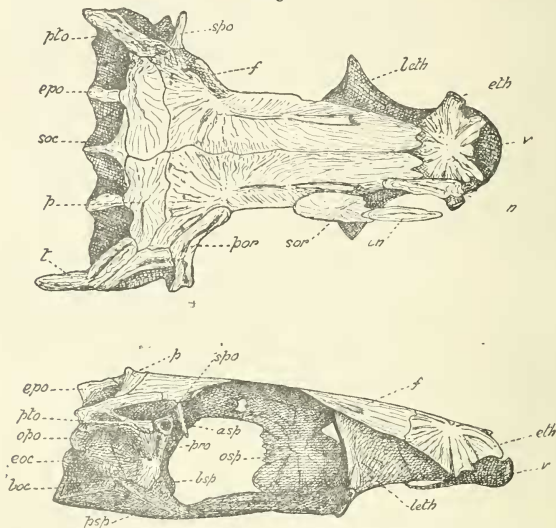
Family 1. Aulopidæ.

The fishes of the genus *Aulopus* are in many ways the most generalized members of the order; the form is moderately elongate, little compressed; the scales are of moderate size; the eyes are lateral and the slightly protractile terminal mouth is rather wide, the maxillary extending back to below the posterior part of the eye or beyond; the maxillary is dilated posteriorly and bears two supramaxillaries; the small conical teeth form narrow bands in the jaws and on the palate, the palato-pterygoid bands being connected in front by that of the vomer. The branchiostegal rays are long, curved and rather numerous (10 to 16), the dorsal fin commences a short distance behind the head and is rather elongate, and the widely separated 9-rayed pelvic fins are inserted below or a little behind the pectorals, which are placed rather low down on the sides. There is no air-bladder.

The skeleton of *Aulopus* is well ossified; the skull is rather elongate, without crests on the flattish upper surface, which is nearly at right angles to the posterior surface. The parietals meet above the supraoccipital and with the pterotics roof the posterior temporal fossæ; the cranium broadens out behind the orbits and the sphenotic has a prominent process directed outwards and downwards; the subtemporal fossa is moderately deep; the orbitosphenoid is a vertical lamina extending from the frontals to the parasphenoid and forming a septum in the anterior half of the interorbital region; posteriorly it is separated from the alisphenoids by a pair of inferior ridges of the frontals; the parasphenoid widens out anteriorly on each side into a broad lamina which unites with the lower edge of the lateral ethmoid; the latter is well ossified, but is separated from its fellow by a wide interspace;

the mesethmoid appears as a large plate overlying the vomer and has a lateral process on each side supporting an upwardly directed process of the anterior part of the palatine, in front of which that bone is suturally united with the vomer; the well-developed mesopterygoid overlaps the parasphenoid; the series of circumorbitals is noteworthy for the firm attachment of the supraorbital to the lateral ethmoid and frontal

Fig. 1.

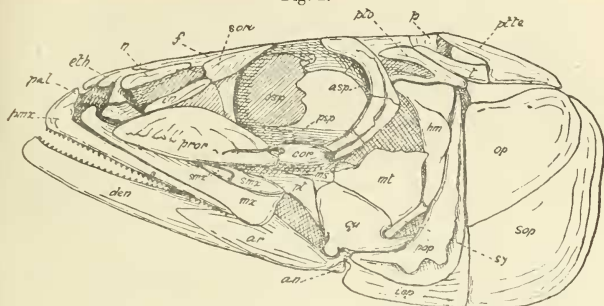


Skull of *Aulopus filamentosus*, from above and from the side.

v, vomer; eth, mesethmoid; leth, lateral ethmoid (præfrontal); n, nasal; in, infranasal; sor, supraorbital; por, postorbital; f, frontal; p, parietal; soc, supraoccipital; eoc, exoccipital; boc, basioccipital; spo, sphenotic (postfrontal); pto, pterotic; epo, epiotic; obo, opisthotic; pro, prootic; psp, parasphenoid; bsp, basisphenoid; asp, alisphenoid; osp, orbitosphenoid; t, temporal plate (lateral dermo-occipital).

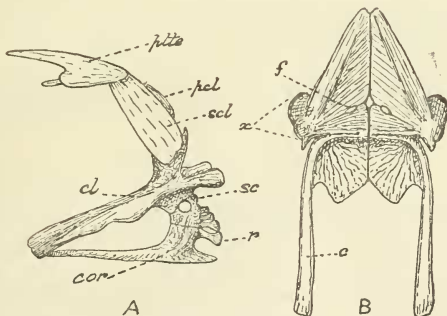
and of the uppermost postorbital to the frontal and sphenotic; there is a well-developed infranasal; the opercular bones are remarkable for the great development of the suboperculum, which forms the entire posterior margin of the gill-opening; the branchiostegals also are long and curved upwards.

Fig. 2.

*Aulopus filamentosus*; lateral view of skeleton of head.

pmx, præmaxillary; *mx*, maxillary; *smx*, *smx'*, supramaxillaries; *den*, dentary; *ar*, articular; *an*, angular; *pal*, palatine; *pt*, pterygoid; *ms*, mesopterygoid; *mt*, metapterygoid; *qu*, quadrate; *sy*, symplectic; *hm*, hyomandibular; *pop*, præoperculum; *op*, operculum; *sop*, suboperculum; *iop*, interoperculum; *n*, nasal; *in*, infranasal; *pror*, præorbital; *cor*, circumorbitals; *sorb*, supraorbital; *osp*, orbitosphenoid; *asp*, alisphenoid; *psp*, parasphenoid; *eth*, mesethmoid; *f*, frontal; *p*, parietal; *pto*, pterotic; *t*, temporal plate; *pte*, post-temporal.

Fig. 3.

*Aulopus filamentosus*.

- A. Pectoral arch. *pte*, post-temporal; *scl*, supracleithrum; *pcl*, post-cleithrum; *cl*, cleithrum; *sc*, hypercoracoid; *cor*, hypocoracoid; *r*, radials.
- B. Pelvic bones. *f*, foramen; *c*, posterior process; *x*, position of base of fin.

Other features of the head skeleton are shown by the figures, and it need only be remarked that the form of the cranium, the development of the temporal fossæ, the general character and arrangement of the frontals, parietals, the otic bones, the nasals, circumorbitals, and supramaxillaries indicate a pretty close relationship to generalized isospondylous fishes such as *Elops* (cf. Ridewood, P. Z. S. 1904, ii. pp. 35-81, c. figg.).

The vertebral column only differs from that of the Elopidae in that the centra are coossified with the arches; there are 52 vertebrae; the centra are perforated; the ribs and epipleurals are inserted together on very short processes which increase in length posteriorly and there is a series of epineurals; the caudal fin skeleton differs from that of the Elopidae chiefly in that there is only one upturned centrum which is rather elongate.

The general characters of the pectoral arch and the pelvic bones are shown in the figures, and it is only necessary to say that the forked post-temporal is firmly attached to the epiotic above and the opisthotic below, and to call attention to the remarkable posterior processes of the pelvic bones.

This family includes the single recent genus *Aulopus*, with the allied Cretaceous *Sardinioides*.

Macristium, Regan, is probably related to *Aulopus*.

The genus *Scopelosaurus* (Bleeker, Act. Soc. Sci. Ned. Ind. viii. 1860, no. 5, p. 12) appears to differ but little from *Aulopus* in the head, mouth, dentition, &c. The body is very elongate, subcylindrical, and has 3 rows of luminous spots on the belly; there are 9 branchiostegals.

The vomerine teeth form a single transverse series, and this character indicates a closer relationship to *Aulopus* than to the Myctophidae.

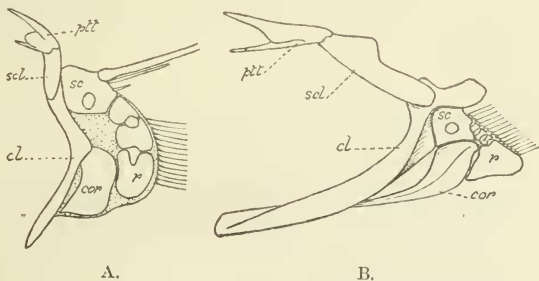
Family 2. Synodontidae.

Differ from the Aulopidae in certain features of specialization. The suspensorium is directed obliquely backwards and the mesopterygoid is less developed than in *Aulopus*; the mouth is wide; there is no supramaxillary, and the slender maxillary is firmly adherent to the præmaxillary or is united with it by suture or ankylosis; there are bands of curved pointed teeth in the jaws and on the palate; the branchiostegals number 11 to 17. The cranium in *Synodus* and *Saurida* is more depressed than in *Aulopus*, with the epiotics further apart and the posterior temporal fossæ much reduced in size; the parasphenoid is laminar and the orbitosphenoid forms a thin septum; the upper fork of the post-temporal

almost touches the supraoccipital, but its extremity is connected with the epiotic by a ligament. The pelvic bones are formed much as in *Aulopus*, with a pair of posterior processes which are slender in *Saurida*, short and laminar in *Synodus*. The vertebral column is as in *Aulopus*, except that there are no upturned centra at the base of the caudal fin; 53 to 62 vertebrae in *Synodus* and *Saurida*.

In addition to the two genera just named this family includes *Bathysaurus* and *Harpodon*; the latter is a highly specialized type, in which the maxillary is no longer recognizable as a separate element; the skeleton is very feebly ossified and transverse processes are not developed on the vertebrae, the ribs being sessile; apparently there is no orbitosphenoid and the frontals and alisphenoids form a complete double interorbital septum, a condition approached in *Saurida*. The pectoral arch differs from that of *Synodus* in the longer and narrower supracleithrum, the almost membranous coracoids, and the absence of the laminar expansion of the lowest radial, in the latter character agreeing with *Saurida*.

Fig. 4.



Pectoral arch of A, *Bathypterois longifilis*; B, *Synodus luciocephalus*.
Lettering as in figure 3.

Family 3. Suidæ.

Chlorophthalmus, usually placed near *Aulopus*, differs from that genus in many ways. The dorsal fin is short and the pelvic fins are close together; the maxillary bears a single supramaxillary; the vomerine teeth form two separate patches; the skeleton is weakly ossified, there is no orbitosphenoid, the parasphenoid is slender, the lateral ethmoids meet in the middle line, the anterior attachment of the palatine

to the vomer is ligamentous, the temporal fossæ are apparently not roofed, the upper limbs of the post-temporal are attached by ligament to the epiotics, but nearly meet above the supra-occipital, and the pelvic bones are simple triangular plates. I have had no skeleton, and I have ascertained these characters from examination of a spirit-specimen. The coracoids and pectoral radials are intermediate between those of *Aulopus* or *Myctophum* and *Bathypterois*. The hypocoracoid is narrowed forward below, but meets the cleithrum far above the symphysis, and the radials are compressed, but not greatly enlarged. The circumorbital and nasal bones are thin, but otherwise as in *Aulopus*. With *Chlorophthalmus* I would associate a number of genera which agree with it in the following characters at least:—

Snout obtusely rounded when seen from above; mouth terminal, with the lower jaw prominent; maxillary dilated posteriorly, with a single supramaxillary usually present. Pointed teeth forming narrow bands or a single series in the jaws and usually on the palatines; vomerine teeth, when present, forming two well-separated patches. Dorsal fin short; pectorals lateral; pelvics usually not widely separated. Skeleton rather weakly ossified; ethmoid without median keel; post-temporals nearly meeting above the supraoccipital. No air-bladder.

Synopsis of the Genera of Sudidæ.

- I. Body moderately elongate, subcylindrical; head as broad as deep; snout rather short; maxillary reaching to below anterior part or middle of eye, which is large; pelvic fins below the dorsal.

1. *Chlorophthalmus*.

- II. Body elongate, subcylindrical or compressed; head depressed, with the snout more or less spatulate; mouth large, the maxillary extending beyond the eye; pelvic fins in advance of the dorsal.

A. None of the fin-rays prolonged.

Eyes present, moderately large 2. *Bathysauropsis*.

No eyes; a paired phosphorescent organ on the head, covered by the thin frontal bones, to the lateral edges of which the suborbitals are attached

3. *Ipomys*.

- B. The outermost ray of the pelvic and the lowest of the caudal excessively prolonged; eyes present, small.

Pectorals normally formed 4. *Benthosaurus*.

Pectoral divided into two subcontiguous portions, the upper part 7-rayed, the first ray prolonged and bifid, the rest gradually decreasing in length below, the lower part of 5 or 6 simple filamentous rays

5. *Hemipterois*.

- C. Outermost pelvic ray usually bifid, or the two branches may coalesce; if short it is thick and flattened distally, if prolonged

more slender and less distinctly flattened; pectoral of two well-separated portions, the upper of a very long bifid ray, usually with 1 or 2 short rays in its axil, the lower of from 8 to 14 simple filamentous rays; lowest caudal ray not excessively prolonged; eyes present, small 6. *Bathypterois*.

III. Body more or less compressed; snout more or less produced; maxillary not reaching the eye.

A. Body moderately elongate, somewhat compressed; dorsal and pelvic fins placed well forward 7. *Parasudis*.

B. Body elongate, strongly compressed; dorsal and pelvic fins placed posteriorly.

No strong canines. 8. *Paralepis* *.

Several long canine teeth on each side of the lower jaw 9. *Sudis*.

The new genus *Bathysauropsis* is here established for *Chlorophthalmus gracilis*, Günth. It differs from *Chlorophthalmus* in the more slender body, depressed head, somewhat smaller eyes, broader interorbital region, broader and more depressed snout, larger mouth, pelvic fins further apart and more advanced, pectorals placed higher, &c. In fact, it is in every way intermediate between *Chlorophthalmus* on the one hand and *Ipnops* and *Benthosaurus* on the other. *Ipnops* resembles it in form, scaling, structure, and position of the fins, mouth, dentition, &c., and it is open to question whether anything is gained by placing it in a different family on account of the characters of specialization indicated in the synopsis. *Benthosaurus* and *Hemipterois* (a new genus with *Bathypterois guentheri*, Alcock, as the type) lead from *Bathysauropsis* to *Bathypterois* †.

* M. Dollo (Proc. R. Soc. Edinb. xxviii. 1908, p. 59) recognizes a family Paralepidæ to include *Paralepis*, *Sudis*, and five other genera. Of these, *Notolepis*, Dollo, seems to differ from *Paralepis* only in having a longer adipose fin, and *Lestidium*, Gilb., is doubtfully distinct from *Sudis*. *Neosudis*, Casteln., and *Plagyodus* (*Alepidosaurus*) are not, in my opinion, members of this group, and *Prymnothonus hookeri* is a larval form of uncertain relationships.

† The species of *Bathypterois* may be provisionally arranged thus:—

I. Lowest pectoral ray very long *quadrifilis*, Günth.

II. Lowest pectoral ray not greatly prolonged.

A. Lower part of pectoral 8 or 9 rayed.

Outermost pelvic rays slightly produced. } *ater*, Gilchr.

} *indicus*, Brauer.

Outermost pelvic rays moderately produced } *longipes*, Günth.

} *dubius*, Vail.

Outermost pelvic rays considerably produced. *longicauda*, Günth.

B. Lower part of pectoral 10 or 11 rayed.

Outermost pelvic ray scarcely produced *antennatus*, Gilb.

Outermost pelvic ray moderately produced. } *pectoralis*, Garm.

} *atricolor*, Alcock.

The new genus *Parasudis*, here established for *Chlorophthalmus truculentus*, Goode & Bean, differs from *Chlorophthalmus* in that the snout is produced so that the maxillary does not reach the eye, whilst the body is more compressed and the vent is placed further back. It is clearly annectant between *Chlorophthalmus* and *Paralepis* and invalidates the claim of the latter to rank as the type of a separate family. I find that in *Paralepis* and *Sudis* the mouth structure is very similar to that of *Chlorophthalmus*; the maxillary is more slender and more adherent to the præmaxillary, but it is somewhat dilated distally and bears a long supramaxillary just as in *Chlorophthalmus*.

Family 4. Myctophidæ.

Closely related to the Sudidæ, from which they differ especially in that (1) a median keel is present on the ethmoid, and (2) the parasphenoid extends upwards to the frontals between the lateral ethmoids. As in the Sudidæ, the vomerine teeth, when present, form two well-separated patches. The body is oblong, compressed; the head is compressed, with the eyes lateral and the mouth terminal. In the more primitive genera the mouth is formed as in *Chlorophthalmus*, with the maxillary strongly expanded behind and bearing a supra-maxillary; but in the more specialized forms the suspensorium is directed obliquely backwards and the slender maxillary is adherent to the præmaxillary, almost as in the Synodontidæ. In *Scopelengys*, Alcock, there are no photophores. *Neoscopelus*, Johnson, has a luminous spot on each scale of the lower part of the body, whilst in *Scopelopsis*, Brauer, every scale bears a spot. In *Myctophum* and its allies the photophores are arranged in definite groups and series. This is apparently the only family of the order in which an air-bladder may sometimes be present.

Neoscopelus is a very generalized Myctophid; the bones are thin, and the skull is less expanded behind the orbits and has the sphenotic process less prominent than in *Aulopus*. The parietals are separated by the supraoccipital, the posterior temporal fossæ are not roofed, there is no orbitosphenoid, and the parasphenoid is slender. As already indicated, the latter bone meets the frontals just behind their junction with the

C. Lower part of pectoral of 12 to 14 rays.

Outermost pelvic ray not or scarcely produced . .	<i>longifilis</i> , Günth.
Outermost pelvic ray moderately produced . . .	<i>filifer</i> , Gilchr.
Outermost pelvic ray considerably produced . . .	<i>insularum</i> , Alcock.
	<i>ventralis</i> , Garm.

mesethmoid, so that the lateral ethmoids are separated and are almost entirely below the level of the parasphenoid; the mesethmoid bears a prominent median ridge. The jaws, the palatine attachment, and the post-temporals are as in *Chlorophthalmus*; the mesopterygoid is well-developed, but does not overlap the parasphenoid; the suboperculum and branchiostegals are not curved upwards behind the operculum; except for the post-temporal attachment the pectoral arch is very much as in *Aulopus*; the pelvic bones are small triangular plates.

There are 32 vertebræ; there are 12 pairs of ribs, the last 7 inserted on parapophyses which increase in length backwards; series of epineurals and epipleurals are present; there are 3 epurals and 2 uroneurals and the last centrum is upturned.

Lampanyctus is a much more specialized form, with slender adherent maxillary and oblique suspensorium; the skull is as broad as long, but agrees with that of *Neoscopelus* in essentials. The vertebral column has 35 vertebræ; all the ribs are inserted on parapophyses.

Suborder 2. ALEPIDOSAUROIDEA.

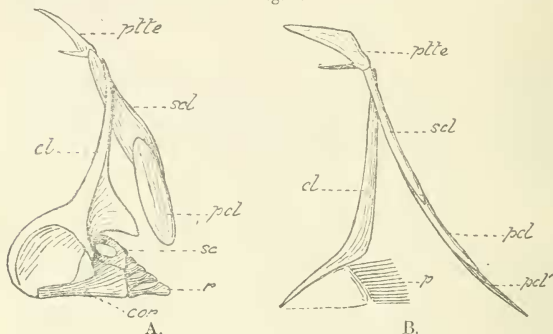
Head and body compressed; caudal well developed, free from the anal; pectorals low; pelvics 6-13 rayed, close together, far behind the pectorals. Mouth large, not protractile; strong pointed canines in the lower jaw and on the palatines; premaxillary and maxillary long and slender, firmly united distally. Palatine large, vertically expanded anteriorly, where it is firmly attached by its upper edge to the frontal and by its inner face to the side of the ethmoidal region; mesopterygoid rather small. Preoperculum narrow, nearly vertical; suboperculum entirely below operculum; interoperculum reduced; 6 to 8 branchiostegals. Ethmoid without median keel or lateral processes; parasphenoid slender; a basisphenoid; no orbitosphenoid. Upper fork of post-temporal connected by ligament with epiotic, but nearly meeting its fellow above the supraoccipital; cleithrum attached to supracleithrum near upper end of the latter, which runs obliquely downwards and backwards and has the upper postcleithrum attached to its distal end. Pelvic bones simple rods or triangular plates. No upturned centra at the base of the caudal fin. No air-bladder.

This suborder contains a few deep-sea fishes with the skeleton rather weakly ossified.

Family 1. Scopelarchidæ.

Snout short. Maxillary with a small anterior expansion; a supramaxillary; canines slender, barbed, forming a regular series in the lower jaw. Skull considerably expanded behind the narrow interorbital region; parietals meeting above supra-occipital; posterior temporal fossæ not roofed; lateral ethmoids separated by an interspace; suborbitals ossified. A single laminar postcleithrum; cleithrum expanded below. 52 vertebrae; ribs on short processes. Dorsal fin short.

Fig. 5.

A. Pectoral arch of *Evermanella hyalina*; from within.B. Pectoral arch of *Omosudis lowii*; external view, with the coracoids and radials not exposed.

ptte, post-temporal; *cl*, cleithrum; *scl*, supracleithrum; *pcl*, *pcl'*, post-cleithra; *sc*, hypercoracoid; *cor*, hypocoracoid; *r*, radials; *p*, fin-rays.

Scopelarchus, Alcock, seems to be more primitive than the other genera. As described and figured it has the head, mouth, teeth, &c. of *Evermanella*, but the dorsal fin is more advanced, there are traces of small scales in addition to the large scales of the lateral line, and the eyes, described as having the visual axis superior rather than lateral, are probably not formed as in *Evermanella*. *Neosudis*, Casteln., may pertain to this family. In *Evermanella*, Fowler (*Odontostomus*), and *Dissoma*, Brauer, the eyes can look upwards or outwards, being lodged in a vertical pocket which is covered externally by a transparent membrane. The skeletal characters given are those of an example of *Evermanella hyalina*.

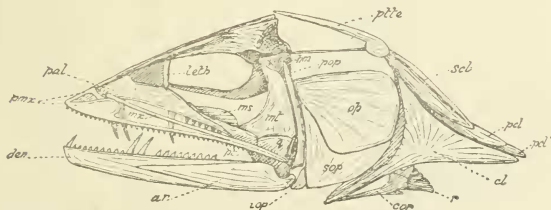
Family 2. Omosudidæ.

The genus *Omosudis*, Günther, agrees with the Scopelarchidæ in its moderately elongate form and short dorsal fin but it has the head, mouth, and teeth of the Alepidosauridæ. It differs from both in the pectoral arch, for the cleithrum is not expanded and the postcleithra are long and slender and reach the ventral profile.

Family 3. Alepidosauridæ.

Body very long, strongly compressed, naked. Snout produced, pointed; maxillary with a large triangular laminar expansion anteriorly; no supramaxillary; teeth compressed; lower jaw with one or a pair of canines on each side. Skull triangular in form when seen from above, gradually increasing in width backwards; interorbital region flat, moderately broad; parietals separated by the supraoccipital; posterior

Fig. 6.



Alepidosaurus ferox; lateral view of skeleton of head and pectoral arch.
Lettering as in figures 2 and 5.

temporal fossæ not roofed; lateral ethmoids meeting in the middle line; suborbitals not ossified. Postcleithra laminar; cleithrum much expanded, triangular or triradiate in form. 51 vertebræ; centra long, without transverse processes; ribs slender, sessile. Dorsal fin very long, of simple non-articulated rays.

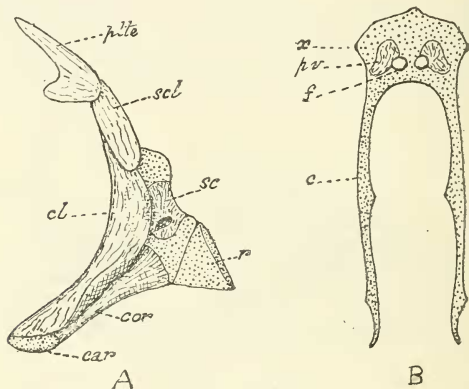
The skeletal characters given are those of an example of *Alepidosaurus ferox*.

The Cretaceous *Apateodus* is known from the skull, jaws, and teeth, which seem to be very similar to those of *Alepidosaurus* and *Omosudis*.

Suborder 3. ATELEOPOIDEA.

Body elongate, naked ; dorsal short, just behind the head ; anal long, united to the reduced caudal ; pectorals lateral ; pelvis in advance of the pectorals, well separated, each of a simple or bifid ray with or without a vestigial ray in its axil. Mouth small, subterminal, protractile downwards ; jaws with bands of small villiform teeth ; one supramaxillary. Suboperculum excluding operculum from margin of gill-opening ; branchiostegals 6 to 8, curved upwards. Cranium in great part cartilaginous, resembling that of *Aulopus* in form, the

Fig. 7.

*Ateleopus indicus.*

- A. Pectoral arch. *ptte*, post-temporal ; *scl*, supracleithrum ; *cl*, cleithrum ; *sc*, hypercoracoid (scapula) ; *cor*, hypocoracoid ; *car*, cartilage to which pelvis is articulated ; *r*, cartilage representing radials.
 B. Pelvis. *pv*, pelvic ossifications ; *f*, foramina ; *c*, posterior cornua ; *x*, place of insertion of fin-ray.

posterior surface nearly vertical with a small occipital crest, the upper surface flattish, much broadened behind the orbits ; frontals separated by a wide fontanel except posteriorly ; parietals separated by the supraoccipital ; epiotics and opisthotics absent ; pterotic large, separated from exoccipital by cartilage ; sphenotic with a prominent process, as in *Aulopus* ; basisphenoid, alisphenoids, and orbitosphenoid absent. Pectoral radials represented by a cartilaginous plate ; pelvis represented by a cartilaginous plate containing two small

ossifications; it bears a pair of long posterior cornua and is movably articulated to the lower surface of the coracoid cartilages. No air-bladder.

Family Ateleopidæ.

The genus *Ateleopus* or *Podateles*, with four species from the Indo-Pacific, was placed by Günther near the Macruridæ. Boulenger examined the pectoral arch in *Ateleopus indicus*, and finding that the foramen was intrascapular placed it near the Ophidiidæ among the jugular Acanthopterygians. In a paper read at the Zoological Congress of 1907 I made this genus the type of a separate order, Chondrobrachii, pointing out the improbability that it was related to fishes such as the Blennioids, which have the pelvic bones directly attached to the cleithra above the symphysis.

The evidence of relationship to *Aulopus* now seems to me so clear that I am disposed to abandon the order Chondrobrachii. *Ateleopus* scarcely differs more from *Aulopus* in fin-structure than *Coilia* does from *Engraulis*, and it is especially noteworthy that the many-jointed simple or bifid pelvic ray is exactly similar to the outer pelvic rays of *Aulopus*; it has been wrongly described as two rays bound together; rather it is the two components of one ray which remain distinct and may separate from each other distally. The resemblances and differences in the pectoral arch and pelvis will be seen on comparing figures 3 and 7. The resemblances in the skull have already been pointed out, but the skeletal differences, mainly due to degeneration or to a persistence of the conditions usually found in very young fish, seem to justify the recognition of a separate suborder for *Ateleopus*.

XIV.—A Description of *Venus stimpsoni*, Gould.

By A. J. JUKES-BROWNE, B.A., F.R.S., M.M.S.

[Plate IV.]

THE shell now described and figured (Plate IV.) was first made known and briefly described by A. G. Gould in 1861* and 1862†, but was not figured by him, nor has any subsequent writer published a figure of it, probably because very

* Boston Soc. Nat. Hist. vol. viii. (1861).

† 'Otia Conchologica,' p. 169 (Boston, 1862).